

LISTING OF THE CLAIMS

WE CLAIM:

1. (Currently amended) A method for alternative routing of a connection between a source node and a destination node in a PNNI hierarchical network, the method comprising responding to a failed connection between said nodes due to a sole-access element of a network structure as seen by the source node, where a said sole-access element is an element which provides sole access to the destination node in said network structure, by:

examining possible routes closest to the destination node;]

selecting at least one non-sole-access element of a particular route used by the failed connection in said network structure;

identifying an alternative route for the failed connection in said network structure which ~~does not utilize~~ utilizes said at least one non-sole-access element; and

using the alternative route for establishment of the failed connection between said source and destination nodes.

2. (original) A method according to claim 1 including checking whether said alternative route satisfies a set of predefined connection constraints, wherein said alternative route is used for establishment of the connection only if said constraints are satisfied.

3. (original) A method according to claim 2 wherein said at least one element is a link of said network structure.

4. (original) A method according to claim 3 wherein the step of selecting comprises selecting all non-sole-access links of the route used by said failed connection which are outside the PNNI peer group of the source node.

5. (original) A method according to claim 3 wherein the step of selecting comprises selecting from the set of all non-sole-access links used by said failed connection which are outside the PNNI peer group of the source node the link which is closest to a predetermined one of the source and destination nodes.

6. (original) A method according to claim 5 including:

(a) if a successful connection is not established using the alternative route, selecting from said set of non-sole-access links the next closest link to the predetermined node, identifying a new alternative route for said connection which does not utilize said next closest link, and using the new alternative route for establishment of the connection between said nodes; and

(b) repeating step (a) for the new alternative route until all links in said set have been selected.

7. (original) A method according to claim 6 including checking whether an identified new alternative route satisfies a set of predefined connection constraints, wherein the identified new alternative route is used for establishment of the connection only if said constraints are satisfied.

8. (original) A method according to claim 6 wherein said new alternative route does not utilize any link of said set between said predetermined node and said next closest link.

9. (canceled)

10. (original) A method according to claim 4 wherein, if a successful connection is not established using said alternative route, the method includes:

(a) selecting from the set of all non-sole-access links used by said failed connection which are outside the PNNI peer group of the source node the link which is closest to a predetermined one of the source and destination nodes, identifying a new alternative route for the connection which does not utilize said closest link, and using the new alternative route for establishment of the connection between said nodes; and

(b) if a successful connection is not established using the new alternative route, selecting from said set of non-sole-access links the next closest link to the predetermined node, identifying a new alternative route for said connection which does not utilize said next closest link and using the new alternative route so identified for establishment of the connection between said nodes; and

(c) repeating step (b) for the new alternative route so identified until all links in said set have been selected.

11. (original) A method according to claim 10 including checking whether an identified new alternative route satisfies a set of predefined connection constraints, wherein the identified new alternative route is used for establishment of the connection only if said constraints are satisfied.

12. (original) A method according to claim 10 wherein the new alternative route identified in step (b) does not utilize any link of said set between said predetermined node and said next closest link.

13. (canceled)

14. (Currently amended) Apparatus for alternative routing of a connection between a source node and a destination node in a PNNI hierarchical network, the apparatus comprising:

memory for storing topology data, defining a network structure as seen by the source node, and route data indicative of a particular route in said network structure used for establishment of a connection between the source node and a destination node;

control logic configured to respond to a failed connection between said nodes due to a sole-access element of the network structure as seen by the source node, where a said sole-access element is an element which provides sole access to the destination node in said network structure, by:

examining possible routes closest to the destination node;

selecting at least one non-sole-access element of the route used by the failed connection in accordance with said route data;

identifying from said topology data an alternative route for the failed connection which ~~does not utilize~~ utilizes said at least one non-sole-access element; and

outputting the alternative route for establishment of the failed connection between said source and destination nodes.

15. (original) Apparatus according to claim 14 wherein the control logic is configured to check whether the alternative route satisfies a set of predefined connection constraints, and to output the alternative route for establishment of the connection only if said constraints are satisfied.

16. (original) Apparatus according to claim 15 wherein said at least one element is a link of said network structure.

17. (original) Apparatus according to claim 16 wherein the control logic is configured to select all non-sole-access links of the route used by said failed connection which are outside the PNNI peer group of the source node when performing said selecting step.

18. (original) Apparatus according to claim 16 wherein the control logic is configured to select from the set of all non-sole-access links used by the failed connection which are outside the PNNI peer group of the source node the link which is closest to a predetermined one of the source and destination nodes when performing said selecting step.

19. (original) Apparatus according to claim 18 wherein the control logic is configured such that:

(a) if a successful connection is not established using the alternative route, the control logic selects from said set of non-sole-access links the next closest link to the predetermined node, identifies a new alternative route for said connection which does not utilize said next closest link, and outputs the new alternative route for establishment of the connection between said nodes; and

(b) the control logic repeats step (a) for the new alternative route until all links in said set have been selected.

20. (original) Apparatus according to claim 19 wherein the control logic is configured to check whether an identified new alternative route satisfies a set of predefined connection constraints, and to output the identified new alternative route for establishment of the connection only if said constraints are satisfied.

21. (original) Apparatus according to claim 19 wherein the new alternative route does not utilize any link of said set between said predetermined node and said next closest link.

22. (canceled)

23. (original) Apparatus according to claim 17 wherein the control logic is configured such that, if a successful connection is not established using said alternative route:

(a) the control logic selects from the set of all non-sole-access links used by said failed connection which are outside the PNNI peer group of the source node the link which is closest to a predetermined one of the source and destination nodes, identifies a new alternative route for the connection which does not utilize said closest link, and outputs the new alternative route for establishment of the connection between said nodes; and

(b) if a successful connection is not established using the new alternative route, the control logic selects from said set of non-sole-access links the next closest link to the predetermined node, identifies a new alternative route for said connection which does not utilize said next closest link, and outputs the new alternative route so identified for establishment of the connection between said nodes; and

(c) the control logic repeats step (b) for the new alternative route so identified until all links in said set have been selected.

24. (original) Apparatus according to claim 23 wherein the control logic is configured to check whether an identified new alternative route satisfies a set of predefined connection constraints, and to output the identified new alternative route for establishment of the connection only if said constraints are satisfied.

25. (original) Apparatus according to claim 23 wherein the new alternative route identified in step (b) does not utilize any link of said set between said predetermined node and said next closest link.

26. (canceled)

27. (Currently amended) A source node of a PNNI hierarchical network, the source node having apparatus for alternative routing of a connection between that source node and a destination node in the network, said apparatus comprising:

- memory for storing topology data, defining a network structure as seen by the source node, and route data indicative of a particular route in said network structure used for establishment of a connection between the source node and a destination node;

- control logic configured to respond to a failed connection between said nodes due to a sole-access element of the network structure as seen by the source node, where a said sole-access element is an element which provides sole access to the destination node in said network structure, by:

 - examining possible routes closest to the destination node;

 - selecting at least one non-sole-access element of the route used by the failed connection in accordance with said route data;

 - identifying from said topology data an alternative route for the failed connection which ~~does not utilize~~ utilizes said at least one non-sole-access element; and

 - outputting the alternative route for establishment of the failed connection between said source and destination nodes.

28. (Currently amended) A route server for association with a peer group of nodes in a PNNI hierarchical network, the route server comprising apparatus for alternative routing of a connection between a source node in said peer group and a destination node in the network, said apparatus comprising:

memory for storing topology data, defining a network structure as seen by the source node, and route data indicative of a particular route in said network structure used for establishment of a connection between the source node and a destination node;

control logic configured to respond to a failed connection between said nodes due to a sole-access element of the network structure as seen by the source node, where a said sole-access element is an element which provides sole access to the destination node in said network structure, by:

examining possible routes closest to the destination node;

selecting at least one non-sole-access element of the route used by the failed connection in accordance with said route data;

identifying from said topology data an alternative route for the failed connection which ~~does not utilize~~ utilizes said at least one non-sole-access element; and

outputting the alternative route for establishment of the failed connection between said source and destination nodes.

29. (Currently amended) A PNNI hierarchical network comprising apparatus for alternative routing of a connection between a source node and a destination node in said network, the apparatus comprising:

memory for storing topology data, defining a network structure as seen by the source node, and route data indicative of a particular route in said network structure used for establishment of a connection between the source node and a destination node;

control logic configured to respond to a failed connection between said nodes due to a sole-access element of the network structure as seen by the source node, where a said sole-access element is an element which provides sole access to the destination node in said network structure, by:

examining possible routes closest to the destination node;

selecting at least one non-sole-access element of the route used by the failed connection in accordance with said route data;

identifying from said topology data an alternative route for the failed connection which ~~does not utilize~~ utilizes said at least one non-sole-access element; and

outputting the alternative route for establishment of the failed connection between said source and destination nodes.

30. (Currently amended) An article of manufacture comprising a computer ~~usable~~ readable medium having a stored computer readable program code means embodied therein for causing alternative routing of a connection between a source node and a destination node in a PNNI hierarchical network, the computer readable program code means in said article of manufacture comprising computer readable program code means for causing a computer to effect the steps of claim 1.

31. (Currently amended) A program storage device readable by a computer ~~machine~~, tangibly embodying a computer program of instructions executable by the ~~machine~~ computer to perform method steps for causing alternative routing of a connection between a source node and a destination node in a PNNI hierarchical network, said method steps comprising the steps of claim 1.

REMARKS

These remarks follow the order of the paragraphs of the office action. Relevant portions of the office action are shown indented and italicized.

Drawings

1. Figures 1-27 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

In response, the applicants respectfully state that Figures 1 and 2 are amended to include a legend --Prior Art--. It is assumed that the reference above to Figure 27 refers to Figure 2. A complete set of drawings accompanies this response.

Claim Rejections 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112: The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-8, 10-12, 14-21, 23-25, and 27-31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1, the claim is ambiguous. Claim 1 recites the limitation "identifying an alternative route for the failed connection in said network structure which does not utilize said at least one non-sole-access element" in lines 9-10. It is unclear as to whether the limitation should be written as "identifying an alternative route for the failed connection in said network structure which utilizes said at least one non-sole-access element", since if there are no non-sole access element in the particular route used by the failed connection then there will be no alternative route to try. The same remark applies to claims 14, 27-29.

In response, the applicants respectfully state that in order to bring this application to allowance quickly, claims 1, 4, 27-29 are amended as recommended above.

This overcomes the rejection of Claims 1-8, 10-12, 14-21, 23-25, and 27-29. under 35 U.S.C. 112, second paragraph. Thus, Claims 1-8, 10-12, 14-21, 23-25, and 27-31 are allowable.

Claim Objections

3. Claims 30-31 are objected to because of the following informalities: Applicant is requested to use the acceptable language in computer-processing related claims below to amend these claims in order to avoid the 35 U.S.C. 101 rejection. Appropriate correction is required. Examples of acceptable language in computer-processing related claims:

- I. “computer readable medium” encoded with _____
 - [a] “a computer program”
 - [b] “software”
 - [c] “computer executable instructions”
 - [d] “instructions capable of being executed by a computer”
- II. “a computer readable medium” _____ “computer program”
 - [a] storing a
 - [b] embodied with a
 - [C] encoded with a
 - [d] having a stored
 - [e] having an encoded

In response, the applicants respectfully state that in order to bring this application to allowance quickly, claims 30 and 31 are amended as recommended above.

This overcomes the rejection of Claims 30 and 31 under 35 U.S.C. 112, second paragraph. Thus, Claims 1-8, 10-12, 14-21, 23-25, and 27-31 are allowable.

Allowable subject matter

4. Claims 30-31 would be allowable if rewritten to overcome the objection, and if claims 1, and 14 rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action

5. Claims 2-8, 10-12, 15-21, and 23-25 would be allowable if claims 1, and 14 rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

In response, the applicants respectfully state that in order to bring this application to allowance quickly, the independent claims are amended, making Claims 1-8, 10-12, 14-21, 23-25, and 27-31 allowable.

Please charge any fee necessary to enter this paper to deposit account 50-0510.

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